

App. No. 09/712,237

Art Unit 3763

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Claim Amendments

Please make the following changes to the claims. Amend claims 30 and 31. Add new claims 32 and 33.

24. *(previously added)* A flow regulator, comprising:
a membrane having at least one hole;
a bottom layer; and
a fluid pathway;

the membrane being positioned above the bottom layer, the fluid pathway being defined from above the membrane through the hole and along the bottom layer on the side facing the membrane, wherein flow thorough the hole causes the membrane to deflect and engage against at least one portion of the bottom layer thereby impeding the fluid pathway.

25. *(previously added)* A flow regulator according to claim 24, wherein the side of the bottom layer facing the membrane further compromises at least one channel which constitutes a part of the fluid pathway, the first end of the channel being in connection with an outlet port, wherein flow through the hole causes the membrane to deflect and engage against at least one portion of the bottom layer thereby forcing the fluid in this portion to flow only in the channel.

26. *(previously added)* A flow regulator according to claim 25, wherein the shape and length of the channel are so designed that an increase of pressure generates an increase of the contact area between the membrane and the bottom layer, thereby defining an additional segment to the channel where fluid is confined, said configuration allowing a proper adjustment of the flow versus pressure characteristics.

27. *(previously added)* A flow regulator according to clam 26, wherein the section of the channel is constant.

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28. *(previously added)* A flow regulator according to claim 26, where in the shape and length of the channel are so designed that the fluid resistance is proportional to the pressure, implying thereby a flow rate independent of the pressure.

29. *(previously added)* A flow regulator according to claim 27 or 28, wherein the channel is a spiral shaped groove.

30. *(previously added, currently amended)* A flow regulator according to any of claims 24 to 2829, wherein the membrane further includes means for sensing the deflection of the membrane.

31. *(previously added, currently amended)* A flow regulator according to any of claims 24 to 2830, wherein the fluid pathway is obstructed when the membrane has reached a predetermined degree of deflection.

32. *(new)* A flow regulator, comprising:

a membrane having at least one hole;

a bottom layer; and

a fluid pathway;

the membrane being positioned above the bottom layer, the fluid pathway being defined from above the membrane through the hole and along the bottom layer on the side facing the membrane, wherein flow thorough the hole causes the membrane to deflect and engage against at least one portion of the bottom layer there by impending the fluid pathway,

wherein the side of the bottom layer facing the membrane further comprises at least one channel which constitutes a part of the fluid pathway, the first end of the channel being in connection with an outlet port, wherein flow through the hole causes the membrane to deflect and engage against at least one portion of the bottom layer thereby forcing the fluid in this portion to flow only in the channel,

wherein the shape and length of the channel are so designed that an increase of pressure generates an increase of the contact area between the membrane and the bottom

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layer, thereby defining an additional segment to the channel where fluid is confined, said configuration allowing a proper adjustment of the flow versus pressure characteristics, wherein a section of the channel is constant and the channel is a spiral shaped groove.

33. (new) A flow regulator, compromising:
a membrane having at least one hole;
a bottom layer; and
a fluid pathway;

the membrane being positioned above the bottom layer, the fluid pathway being defined from above the membrane through the hole and along the bottom layer on the side facing the membrane, wherein flow thorough the hole causes the membrane to deflect and engage against at least one portion of the bottom layer there by impending the fluid pathway,

wherein the side of the bottom layer facing the membrane further compromises at least one channel which constitutes a part of the fluid pathway, the first end of the channel being in connection with an outlet port, wherein flow through the hole causes the membrane to deflect and engage against at least one portion of the bottom layer thereby forcing the fluid in this portion to flow only in the channel,

wherein the shape and length of the channel are so designed that an increase of pressure generates an increase of the contact area between the membrane and the bottom layer, thereby defining an additional segment to the channel where fluid is confined, said configuration allowing a proper adjustment of the flow versus pressure characteristics,

wherein the shape and length of the channel are so designed that the fluid resistance is proportional to the pressure, implying thereby a flow rate independent of the pressure and the channel is a spiral shaped groove.